## Amendments to the Specification:

Please amend paragraph 00140, as follows:

With reference to Figure 21, the general flow of the histogram algorithm is to take a discrete sampled time-domain signal and use Fourier analysis to convert it to a frequency domain spectrum for further analysis. The time-domain signals are acquired from an ADC (analog/digital converter) and stored in the buffer indicated at 2102. This sample is *SampleDuration* seconds long, and is sampled at *SampleRate* samples per second, thus providing *SampleCount* (*SampleDuration* * *SampleRate)* samples. The *FrequencyRange* that can be recovered from the signal is defined as half the *SampleRate*, as defined by Nyquist. Thus, if a time-series signal is sampled at 10,000 samples per second, the *FrequencyRange* will be 0 Hz to 5 kHz. One Fourier algorithm that may be used is a Radix 2 Real Fast Fourier Transform (RFFT), which has a selectable frequency domain resolution (*FFTSize*) of powers of two up to $2^{16}$. An *FFTSize* of 8192 is selected, to provide ~~provides~~ enough resolution to have at least one spectrum bin per Hertz as long as the *FrequencyRange* stays at or below 8 kHz. The *SampleDuration* should be long enough such that *SampleCount* >**(2*)** *FFTSize* * 10 to ensure reliable results.

Please amend the abstract of the disclosure as follows:

A method and apparatus for interrogating a sample that exhibits molecular rotation ~~are disclosed. In practicing the method,~~ includes placing the sample ~~is placed~~ in a container having both magnetic and electromagnetic shielding, ~~and~~ where Gaussian noise is injected into the sample. An electromagnetic time-domain signal composed of sample source radiation superimposed on the injected Guassian noise is detected, and this signal is used to generate a spectral plot that displays, at a selected power setting of the Gaussian noise source, low-frequency spectral components characteristic of the sample in a selected frequency range between DC and 50 kHz. In one embodiment, the spectral plot that is generated is a histogram of stochastic resonance events over the selected frequency range. From this spectrum, one or more low-frequency signal components that are characteristic of the sample being interrogated are identified.